

Roncus ivanjicae, a New Epigeal Pseudoscorpion from Serbia,
Yugoslavia (Pseudoscorpiones: Neobisiidae), with Notes on
the Validity of Some Diagnostic Characters

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Abstract A new species, *Roncus ivanjicae* ČURČIĆ et ČURČIĆ (Pseudoscorpiones: Neobisiidae) is described from western Serbia, Yugoslavia. It is illustrated and compared with its nearest known congener, *R. satoi* ČURČIĆ et DIMITRIJEVIĆ, from southwestern Serbia (Yugoslavia). Notes are given on the habitat, distribution and validity of some diagnostic characters of some *Roncus* species.

The genus *Roncus* L. KOCH, 1873, was erected for the species *R. lubricus* L. KOCH, 1873 (GARDINI, 1983; ČURČIĆ & DIMITRIJEVIĆ, 1994; ČURČIĆ *et al.*, 1992). The majority of representatives of this genus inhabit the Iberian Peninsula, the Apennines, and the Balkan Peninsula (ČURČIĆ & DIMITRIJEVIĆ, 1994). In Serbia (Yugoslavia), which occupies the central part of the Balkan Peninsula, 15 species of *Roncus* are presently known (ČURČIĆ & DIMITRIJEVIĆ, 1994; ČURČIĆ *et al.*, 1994); most of these are relict and endemic forms.

In this study, material from two samples of pseudoscorpions, collected in 1994 is examined; specimens studied from Ravana, Ivanjica, western Serbia (Yugoslavia), belong to a new epigeal species: *Roncus ivanjicae*, which is described below based on the series of 7 individuals (1 male, 2 females, and 4 tritonymphs).

Neobisiidae CHAMBERLIN, 1930

Roncus ivanjicae ČURČIĆ et ČURČIĆ, sp. nov.

(Figs. 1–22; Table 1)

Etymology. This species is named after its type-locality.

Specimens examined. Holotype male, allotype female, paratype female, and 3 paratype tritonymphs, from (beech) leaf litter and humus, Ravana, Ivanjica, western Serbia, Yugoslavia, 15–16 October 1994 (R. N. DIMITRIJEVIĆ, S. E. MAKAROV, L. R. LUČIĆ, and O. S. KARAMATA coll.); paratype tritonymph, from the same locality, 20 August 1994 (B. P. M. ČURČIĆ and S. V. DJUKIĆ coll.). The type specimens are deposited in the collection of the Institute of Zoology, Faculty of Science (Biology), University of Belgrade, Belgrade.

Description. Carapace longer than broad (Figs. 1–2; Table 1). Epistome triangular or blunt apically (adult; Figs. 3–4) or knob-like (tritonymph; Fig. 5).

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Eyes with flattened lenses (spot-like), less pronounced in tritonymphs (traces of tapetum still visible). Setal formulae: $4+6+2+4+2+6=24$ (adult; Figs. 1–2) and $4+6+2+4+2+6=24$ and $4+1+6+4+2+6=23$ setae (tritonymph).

Tergite I with 6 (rarely 7) setae (adult, tritonymph), tergite II with 8–10 (adult) and 7–9 setae (tritonymph), tergites III–X each with 9–12 setae (adult, tritonymph). Male genital area: sternite II with a cluster of 15 longer setae medially and posteriorly; of these, 6 longer setae along posterior border and 9 shorter setae mid-posteriorly, thinning out anteriorly. Sternite III with 4 anterior and median setae, 9 posterior setae, and 3 microsetae along each stigma. Sternite IV with 13 marginal setae and 2 small suprastigmatic microsetae on each side. Female genital area: sternite II with 8 or 9 microsetae, in the form of a transverse patch or two barely distinguishable groups; sternite III with 9–12 posterior setae and 3 microsetae along each stigma. Sternite IV with 9 or 10 marginal setae and 2 or 3 suprastigmatic microsetae on each side. Sternites V–X each with 12–15 setae (adult).

Galea low and rounded (Figs. 11–12). Cheliceral palm with 6, movable finger with one seta (adult, tritonymph). Cheliceral dentition as in Figs. 11–12. Flagellum 8– (rarely 7–) (adult), and 7-bladed (tritonymph) (1 short proximal blade and 6 or 7 longer blades distally, all blades denticulate).

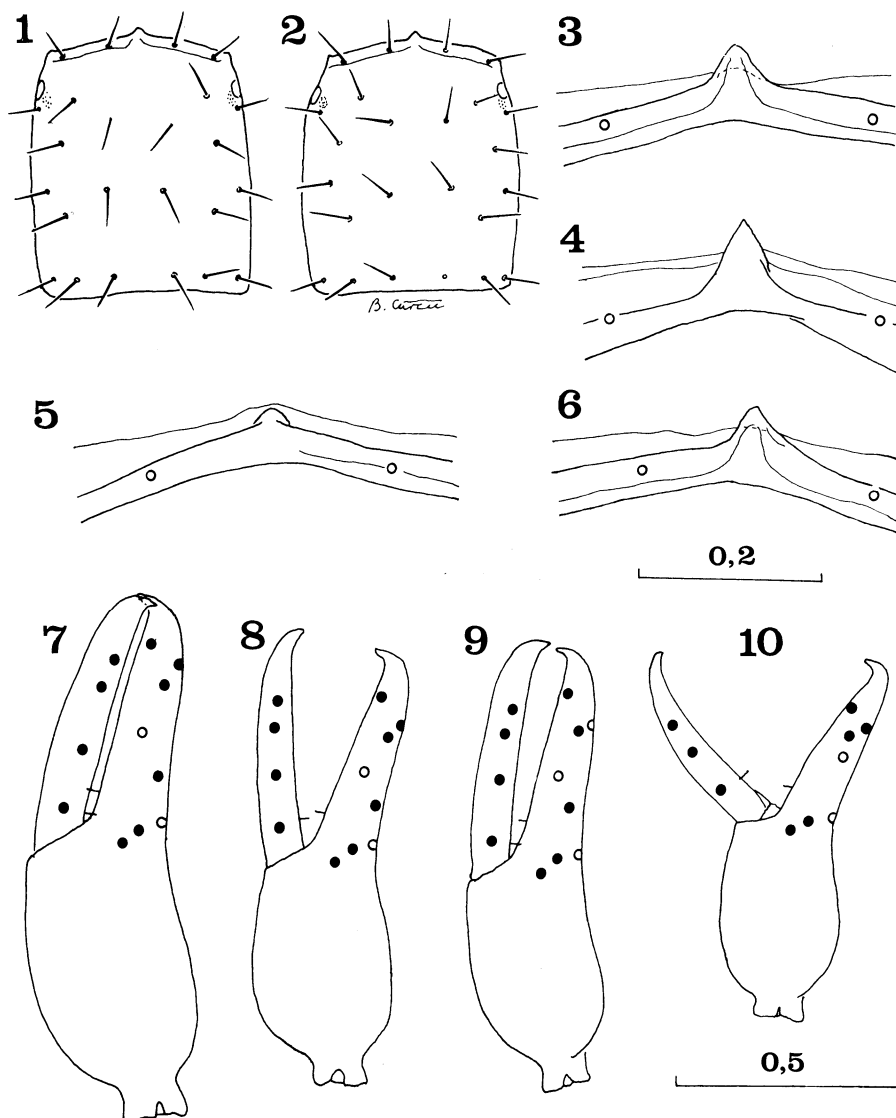
Apex of pedipalpal coxa with 4 (adult; Fig. 13), and 3 or 4 long setae (tritonymph). Pedipalpal trochanter with few faint exterior granulations (male) or smooth (female, tritonymph); in addition, this podomere carries some tiny denticulations dorsally (adult, tritonymph). Pedipalpal femur with some interior (tritonymph) or with interior and dorso-proximal granulations (adult; Figs. 18–22). Tibia smooth; chelal palm with interior (adult, tritonymph) and few faint granulations exteriorly (male). Microsetae proximal to *eb* and *esb*: none (male), 0–1 (female), and 0–2 (tritonymph) (Figs. 14–17). A single tubercle present on the laterodistal side of chelal palm. The trichobothrium *ist* is closer to *isb* than to *est* (Figs. 7–9). Fixed chelal finger with 49 (male), 45–56 (female), and 29–49 teeth (tritonymph). Movable chelal finger with 47 (male), 46–56 (female), and 37–47 teeth (tritonymph). The number of teeth on the fixed chelal finger is greater (male), equal to (female), and lower, equal or greater (tritonymph) than on the movable chelal finger.

Chelal fingers slightly (female, tritonymph) or distinctly longer than chelal palm (male), and shorter than pedipalpal femur (Table 1). Pedipalpal femur almost equal to (female), longer than (male) or shorter than carapace (tritonymph) (Table 1). Trichobothriotaxy as in Figs. 7–10.

Tibia IV, basitarsus IV, and telotarsus IV each with a single tactile seta (Fig. 18). Tactile seta ratios are presented in Table 1.

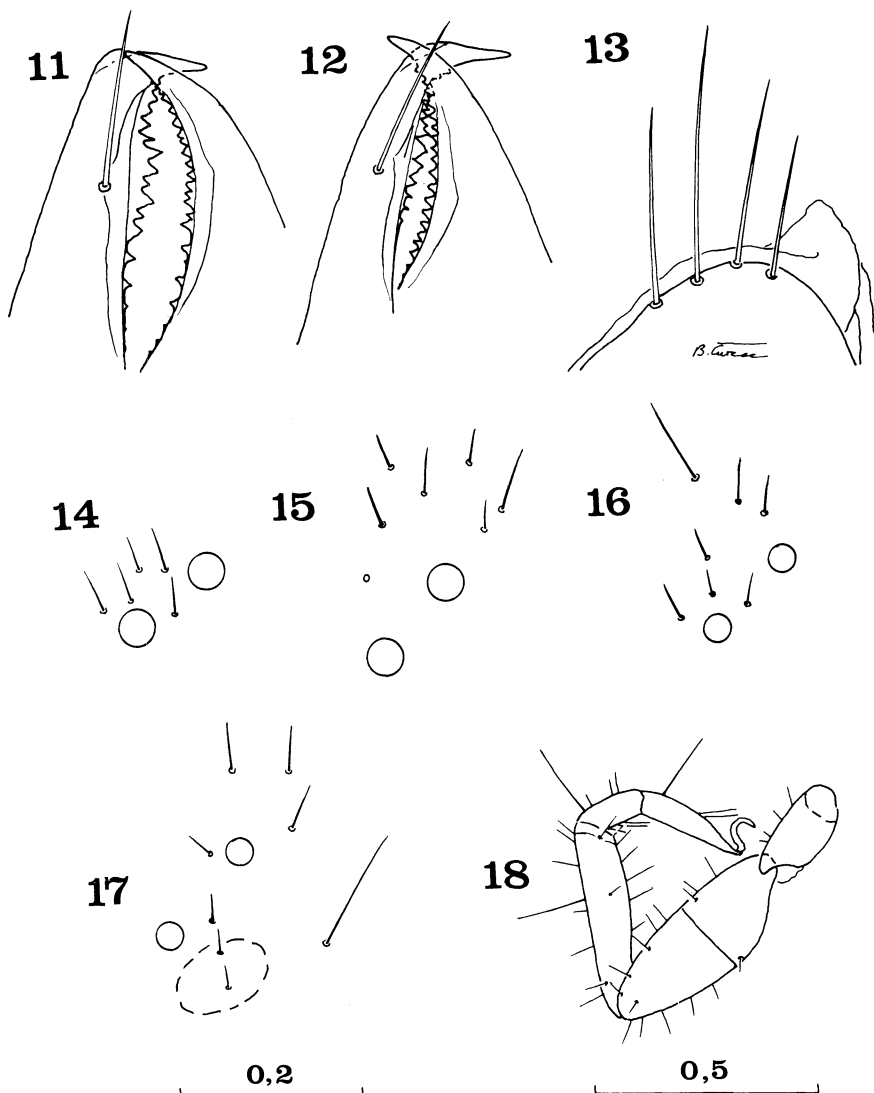
Distribution. Western Serbia (Yugoslavia), epigeal (in leaf litter, humus, and soil); probably endemic species.

Remarks. The new species is easily distinguished from all other Serbian species of *Roncus* which possess microsetae proximal to the trichobothria *eb* and *esb*, viz. *R. pannoniensis* ČURČIĆ, DIMITRIJEVIĆ et KARAMATA, 1992, from northern and western Serbia; *R. trojan* ČURČIĆ, 1993, from southeastern Serbia; *R. strahor* ČURČIĆ, 1993, from southeastern Serbia, and *R. satoi* ČURČIĆ et DIMITRIJEVIĆ, 1994, from southwestern Serbia (Yugoslavia) (ČURČIĆ, 1992; ČURČIĆ & DIMITRIJEVIĆ, 1994; ČURČIĆ *et al.*, 1992, 1993, 1994).



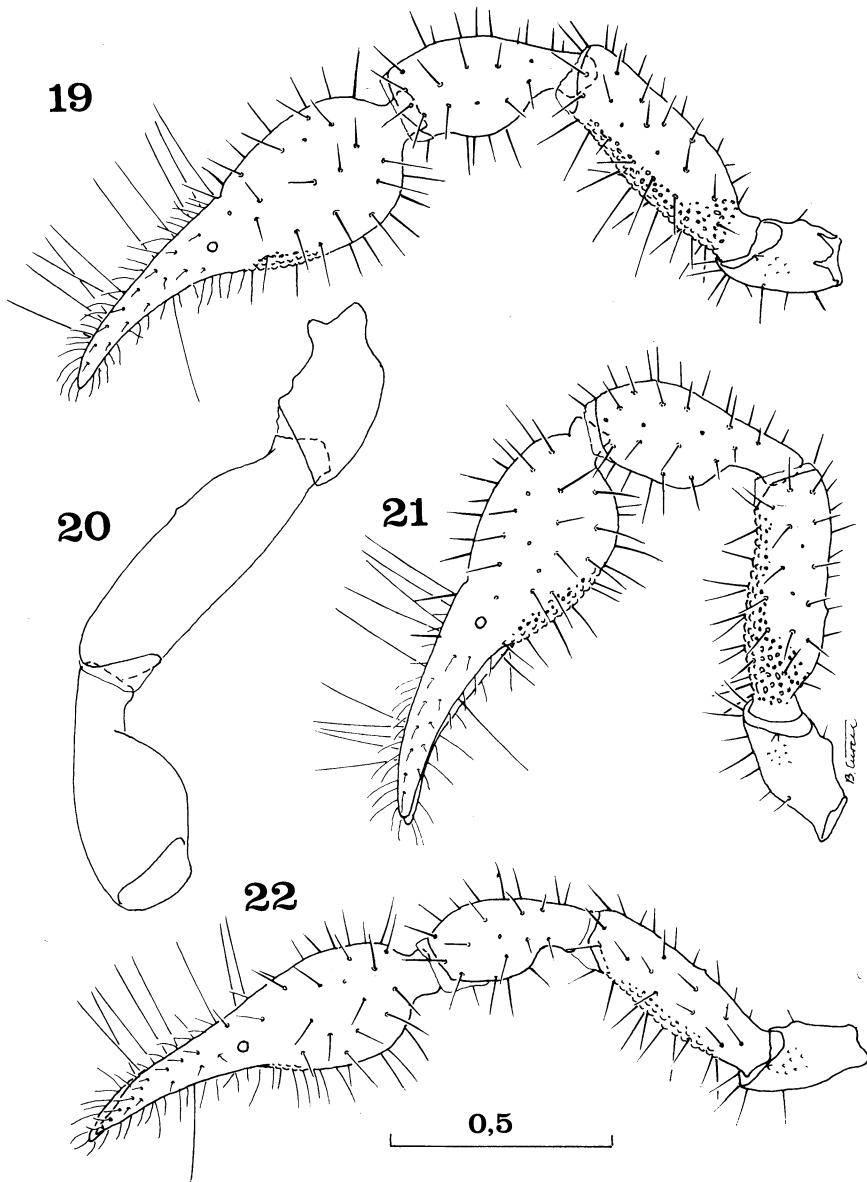
Figs. 1–10. *Roncus ivanjicae* sp. nov., from Serbia (Yugoslavia).—1, Carapace, allotype female; 2, carapace, holotype male; 3, epistome, allotype female; 4, epistome, paratype female; 5, epistome, paratype tritonymph; 6, epistome, holotype male; 7, pedipalpal chela (trichobothrial pattern), paratype female; 8, pedipalpal chela (trichobothrial pattern), allotype female; 9, pedipalpal chela (trichobothrial pattern), holotype male; 10, pedipalpal chela (trichobothrial pattern), paratype tritonymph. Scales in mm.

From *R. pannoniensis*, *R. ivanjicae* sp. nov. is easily distinguished by the presence/absence of dorsal and proximal granulations on the pedipalpal femur (absent vs. present), by the relative position of the trichobothrium *ist* (closer to *est* vs. closer to



Figs. 11-18. *Roncus ivanjicae* sp. nov., from Serbia, Yugoslavia. —11, Cheliceral fingers, paratype female; 12, cheliceral fingers, holotype male; 13, apex of pedipalpal coxa, allotype female; 14, microsetae distal to *eb* and *esb*, allotype female; 15, microsetae distal to *eb* and *esb*, paratype female; 16, microsetae distal to *eb* and *esb*, holotype male; 17, microsetae distal and proximal to *eb* and *esb*, paratype tritonymph; 18, leg IV, holotype male. Scales in mm.

isb), by the number of teeth on the fixed and movable fingers of the pedipalpal chelae of males (55-63 vs. 49 and 57-63 vs. 47, respectively), by the pedipalpal length of females (3.65-4.06 mm vs. 2.88-3.51 mm) and males (3.51-3.89 mm vs. 2.07 mm), by the carapace length of males (0.72-0.81 mm vs. 0.59 mm), by the



Figs. 19–22. *Roncus ivanjicae* sp. nov., from Serbia (Yugoslavia).—19, Pedipalp, allotype female; 20, pedipalpal trochanter, femur, and tibia, paratype female; 21, pedipalp, holotype male; 22, pedipalp, paratype tritonymph. Scale in mm.

pedipalpal chelal finger length of males (0.68–0.745 mm *vs.* 0.58 mm), and by the leg IV length of males (2.56–2.775 mm *vs.* 2.04 mm).

R. ivanjicae sp. nov. is also distinguished from *R. trojan* by the presence/absence of dorso-median and dorso-distal granulations on the pedipalpal femur (absent *vs.*

Table 1. Linear measurements (in mm) and selected morphometric ratios in *Roncus ivanjicae* sp. nov., from Serbia, Yugoslavia. Abbreviations: trito=tritonymphs, TS=tactile seta.

Character	♀♀	♂	trito
Body			
Length (1)	2.355–2.68	2.17	1.43 –1.63
Cephalothorax			
Length (2)	0.64 –0.69	0.59	0.47 –0.58
Breadth	0.51 –0.58	0.48	0.37 –0.43
Abdomen			
Length	1.715–1.99	1.58	0.89 –1.08
Breadth	0.89 –1.07	0.89	0.47 –0.69
Chelicerae			
Length (3)	0.38 –0.45	0.37	0.29 –0.34
Breadth (4)	0.205–0.24	0.195	0.15 –0.18
Length of movable finger (5)	0.27 –0.315	0.26	0.205–0.24
Length of galea	0.01	0.01	0.005–0.01
Pedipalps			
Length with coxa (6)	2.88 –3.51	3.07	2.105–2.505
Length of coxa	0.44 –0.49	0.48	0.36 –0.40
Length of trochanter	0.36 –0.43	0.37	0.27 –0.30
Length of femur (7)	0.59 –0.73	0.64	0.425–0.51
Breadth of femur (8)	0.19 –0.22	0.19	0.14 –0.16
Ratio 7/8	3.105–3.32	3.37	2.93 –3.19
Ratio 7/2	0.92 –1.06	1.08	0.78 –1.09
Length of tibia (9)	0.47 –0.58	0.53	0.34 –0.40
Breadth of tibia (10)	0.22 –0.27	0.22	0.16 –0.19
Ratio 9/10	2.14 –2.15	2.41	2.105–2.25
Length of chela (11)	1.02 –1.28	1.05	0.71 –0.895
Breadth of chela (12)	0.39 –0.39	0.30	0.22 –0.26
Ratio 11/12	3.19 –3.28	3.50	3.23 –3.50
Length of chelal palm (13)	0.48 –0.62	0.47	0.34 –0.425
Ratio 13/12	1.50 –1.59	1.57	1.545–1.73
Length of chelal finger (14)	0.54 –0.66	0.58	0.37 –0.47
Ratio 14/13	1.06 –1.125	1.23	1.03 –1.105
Leg IV			
Total length	2.05 –2.54	2.04	1.47 –1.78
Length of coxa	0.37 –0.40	0.34	0.25 –0.30
Length of trochanter (15)	0.27 –0.32	0.25	0.18 –0.23
Breadth of trochanter (16)	0.11 –0.15	0.11	0.085–0.14
Ratio 15/16	2.13 –2.45	2.27	1.64 –2.12
Length of femur (17)	0.51 –0.56	0.52	0.37 –0.47
Breadth of femur (18)	0.17 –0.23	0.19	0.14 –0.19
Ratio 17/18	2.83 –3.00	2.74	2.47 –3.14
Length of tibia (19)	0.47 –0.61	0.47	0.31 –0.39
Breadth of tibia (20)	0.10 –0.12	0.10	0.08 –0.10
Ratio 19/20	4.70 –5.08	4.70	3.875–4.00
Length of basitarsus (21)	0.17 –0.22	0.18	0.13 –0.15
Breadth of basitarsus (22)	0.08 –0.085	0.07	0.06 –0.075
Ratio 21/22	2.125–2.59	2.57	1.86 –2.17
Length of telotarsus (23)	0.26 –0.34	0.28	0.19 –0.25
Breadth of basitarsus (24)	0.07 –0.08	0.07	0.06 –0.075
Ratio 23/24	3.71 –4.25	4.00	3.17 –3.33
TS ratio—tibia IV	0.51 –0.58	0.60	0.44 –0.58
TS ratio—basitarsus IV	0.19 –0.26	0.21	0.21 –0.30
TS ratio—telotarsus IV	0.26 –0.30	0.23	0.23 –0.32

present), by the relative position of the trichobothrium *ist* (closer to *isb* vs. closer to *est*), by the number of teeth on the fixed and movable fingers of the pedipalpal chelae of males (49 vs. 54–43 and 47 vs. 51–63, respectively), by the pedipalpal femur length to carapace length ratio of females (0.92–1.06 vs. 1.255–1.42), by the leg IV length of males (2.04 mm vs. 2.385–2.70 mm), by the carapace length of males (0.59 mm vs. 0.67–0.81 mm), by the pedipalpal chelal finger length of females (0.54–0.66 mm vs. 0.69–0.75 mm) and males (0.58 mm vs. 0.64–0.75 mm), and by the pedipalpal chelal finger length to chelal palm length ratio of tritonymphs (1.03–1.105 vs. 1.16–1.34).

In addition, *R. ivanjicae* sp. nov. also differs from *R. strahor* in many important respects, such as: the presence/absence of dorso-proximal granulations on the pedipalpal femur (present vs. absent), the form of the pedipalpal femur (with convex interior side vs. with almost parallel sides), the position of the trichobothrium *ist* (closer to *isb* vs. equidistant from *isb* and *est*), the number of teeth on the fixed and movable fingers of the pedipalpal chelae of males (49 vs. 51–54 and 47 vs. 52–61), by the leg IV length of males (2.04 mm vs. 2.095–2.46 mm), and by the form of the pedipalpal chelal palm of males (ovate vs. globular).

From its phenetically most similar congener, *R. satoi*, *R. ivanjicae* sp. nov. differs considerably in the presence/absence of dorso-proximal granulations on the pedipalpal femur (absent vs. present), by the presence/absence of dorsal granulations on the pedipalpal chelal palm (present vs. absent), by the number of teeth on the fixed and movable fingers of the pedipalpal chelae of males (56–61 vs. 49 and 56–67 vs. 47), by the pedipalpal chelal length to breadth ratio of females (3.10 vs. 3.19–3.28), and by the leg IV length of males (2.185–2.255 mm vs. 2.04 mm).

In lieu of a conclusion. The variety of both cavernicolous and epigeal representatives of *Roncus* in Serbia (ĆURČIĆ *et al.*, 1994) offers proof that this genus is presently in a phase of actively radiating into new taxa. Furthermore, the diversity of *Roncus* in the regions bordering on Serbia (ĆURČIĆ *et al.*, in press) points to the Balkan Peninsula as an important centre of origin and evolution of numerous forms of the genus (ĆURČIĆ *et al.*, 1994). In addition, the existence of numerous representatives of *Roncus* with limited geographic distribution demonstrates their pronounced endemism.

With regard to some diagnostic characters of the species, it should be noted that these features are more variable in *R. ivanjicae* sp. nov. than in any of its closely related congeners. This particularly refers to the presence/absence and number of tiny microsetae proximal to the trichobothria *eb* and *esb*, the number of flagellar blades, the number of teeth on the fixed and movable fingers of the pedipalpal chelae, the presence/absence and degree of granulation on the pedipalpal podomeres, and some morphometric ratios (e.g., pedipalpal chelal finger length to pedipalpal femur length ratio, and pedipalpal femur length to carapace length ratio).

It should be noted that microsetae proximal to *eb* and *esb* are present in *R. pannoniensis*, *R. trojan*, *R. strahor*, *R. satoi*, and (occasionally in) *R. ivanjicae* sp. nov., and virtually absent in all other *Roncus* species from Serbia (Yugoslavia). It was suggested that the presence or absence of this character might be useful in distinguishing between groups of species of *Roncus* (ĆURČIĆ & DIMITRIJEVIĆ, 1994; ĆURČIĆ *et al.*, 1994). However, this character is highly variable in *R. ivanjicae* sp. nov. (0–0 in a male; 0–0 and 1–2 in females; and 0–0, 0–1, and 2–2 in tritonymphs);

hence its taxonomic weight is very low, or practically neglectable (at least, as far as the new species is concerned). Therefore, the present knowledge of the geographical (and developmental) distribution of this character does not permit as yet precise conclusion on the exact distribution patterns of the species (or species groups) of *Roncus*, beset with or deprived of microsetae proximal to the trichobothria *eb* and *esb* (ČURČIĆ & DIMITRIJEVIĆ, 1994). Additionally, the position of the sensilla on the movable fingers of the pedipalpal chelae has also a very limited (if any) taxonomic value (ČURČIĆ, pers. obs.).

Some other diagnostic characters also vary in *R. ivanjicae* sp. nov. Among these, the number of flagellar blades (8–8 in a male, 7–8 and 8–8 in females), the granulation of the pedipalpal articles (dorsal and proximal granulations on pedipalpal femur present in adults, but absent in tritonymphs; faint exterior and lateral granulations on the pedipalpal chelal palm present in adults, but lacking in tritonymphs), and the number of teeth on the pedipalpal chelae (less variable in adults, more variable in tritonymphs) should be mentioned in particular. To this should be added the variation of some morphometric ratios (Table 1). All these phenomena confirm the fact that the Balkan *Roncus* species, including *R. ivanjicae* sp. nov., are presently subjected to intensive radiation or the colonisation of different niches. However, such variation may be also due to hybridisation with the epigean ancestor after isolation in a particular niche.

Biogeographically, it is evident that *R. pannoniensis*, *R. trojan*, *R. strahor*, *R. satoi*, and *R. ivanjicae* sp. nov. are the descendants of the old Balkanic fauna of pseudoscorpions. All these taxa are autochthones, and they probably represent relicts. Therefore, the Balkan Peninsula (and the adjoining areas) represents the main refugial zone of a previously existing Mediterranean fauna of pseudoscorpions (ČURČIĆ *et al.*, 1993, 1994).

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